

TAUMARI

BETTER BRAIN DIAGNOSTICS

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Home Services Research FAQs News



Supporting Our Soldiers

concerned about long-term effects of head injury. TauMark is working to provide the knowledge that will empower them to make the right decisions about protecting their future brain health.

Why TauMark

How it Works

How to Get Started

Get Started, Get Safe

Please check the website for upcoming announcements on when and where TauMark scans will soon be available.

Resources and Links

Brain Injury Research Institute League of Denial: The NFL's Concussion Crisis

Brain Injury Network

Upcoming Events

Traumatic Brain Injury Conference .. read more

League of Denial: The NFL's Concussion Crisis .. read more

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TauMark owns the exclusive

and eventual cure.

license of the first and only brain measure of tau protein—the physical

evidence of traumatic brain injury, neurodegeneration, dementia, and Alzheimer's disease. TauMark's mission is to provide better brain diagnostics in living patients—the foundation for treatment, prevention

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Contact TauMark Contact us to learn more about brain function and a healthy lifestyle.

info@taumark.com 855-588-0288

All TauMark studies are performed with the highest medical standards of patient care and confidentiality.



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Better Brain Diagnostics

For prevention and improved quality. TauMark's non-inva-technique is being developed to h monitor novel treatments design to prevent and treat the bi damage of traumatic injury.

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TauMark for Prevention and Intervention

After concussions and traumatic brain injury, abnormal tau protein deposits accumulate in brain regions that control memory, thinking, and mood. An FDDNP brain PET scan (licensed exclusively to TauMark) is the only available non-invasive method to measure the distribution and level of brain tau (your "T-Number"). The goal is to help doctors detect problems early and monitor treatments.

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Helping Our Se

who worry ab memory slips. T assist in early Alzheimer's and patients and their treatment early longer.

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An Easy and Safe Method

The FDDNP compound (licensed to Taumark) contains a small amount of a rapidly disappearing radiation tag. For the PET scan, about a tablespoon of FDDNP preparation is injected into the patient's arm vein, allowing the chemical marker to reach the brain. The PET scan measures brain radioactivity accumulation for about 45 minutes, thus pinpointing areas where any tau protein deposits are present.

read more

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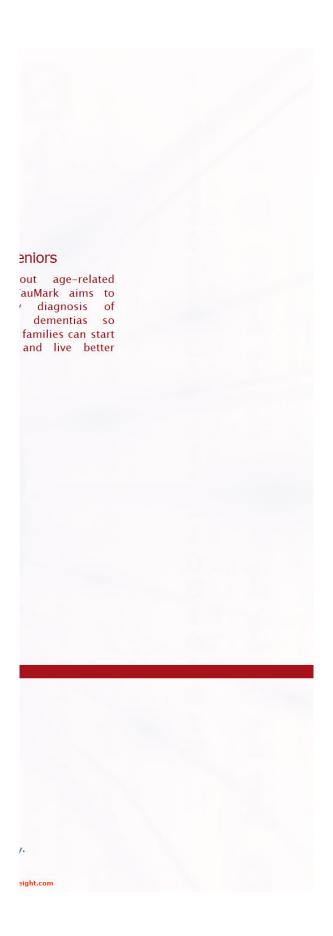


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Protecting Our

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Athletes know about concussive brain s goal is to help formed decisions t options and they can optimize as they age. eight.com



Services



TauMark plans to make the following services available in the near future:

Basic TauMark Scan and Clinical Summary

TauMark PET scan (developed as FDDNP; licensed from UCLA), MRI scan, neuropsychological assessment, including:

- · Clinical diagnosis and summary;
- · Results of structural MRI scan;
- Copy of TauMark PET scan images and summary report with numerical values for brain regions of interest and T-Number (summary score for brain tau level and distribution).

Additional Service:

- MRI scan measuring brain abnormalities of white matter structure (Diffusion Tensor Imaging or DTI);
- Neurological examination;
- APOE testing for Alzheimer's genetic risk.

Complete TauMark Package

- Basic TauMark Scan and clinical summary;
- DTI-MRI scan and analysis;
- Neurological examination and report;
- APOE genetic testing results.

What to Expect

- TauMark Scan:
- Injection of TauMark in arm vein followed by 45 minute PET brain scan;
- Many hundreds of scans performed over the last 15 years have demonstrated the high safety profile of TauMark Scans with no reported adverse effects.
- MRI Scan:
- 20 minute scan (30 minutes if DTI is included);
- Narrow scanner tube rarely causes claustrophobia.
- Neuropsychological testing:
- 30 minutes of background information and questionnaires;
- Less than 2 hours of pencil and paper testing.
- APOE testing
- 2 teaspoons of blood drawn from arm vein;
- Rarely causes skin bruising

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Research

Despite the devastating consequences of traumatic brain injury and the large number of athletes, military personnel and other head trauma victims at risk, until now, no method has been developed for early detection or tracking of the brain pathology associated with these injuries. However, recent research in former NFL players showed that the FDDNP PET scan(now exclusively licensed to TauMark) demonstrates a pattern of tau deposition expected from numerous brain autopsy studies of chronic traumatic encephalopathy (CTE), a degenerative condition associated with memory loss, dementia, depression, personality changes, and abnormal body movements. Researchers performed PET brain scans on retired football players and compared the scans with those of healthy men of comparable age, education, and body mass index. Compared with the healthy men, the symptomatic NFL players had elevated levels of FDDNP in the amygdala and subcortical areas, brain regions that control learning, memory, behavior, emotions and other mental and physical functions. Those players who experienced a greater number of concussions had higher levels of TauMark throughout the brain. For ${\it more}$ information click here »

In addition to studying traumatic brain injury and the effects of concussions, scientists from around the world have used the FDDNP PET scan to demonstrate its usefulness in improving brain diagnostics in multiple neurological conditions, including neurodegenerative tauopathies, Alzheimer's disease, depression, Down syndrome, and more: For the first time, FDDNP PET scans were used to demonstrate the presence of tau aggregates-similar to those found in CTE—in neurodegenerative tauopathies. For more information click here »

FDDNP PET scans also showed tau aggregates in the living brain of Lewy body dementia patients, later validated by autopsy. For more information click here »

The presence of tau aggregates in the medial temporal lobe of Alzheimer's disease patients were demonstrated in a seminal study. For more information click here »

In a study with no precedence, FDDNP binding to tau was uniquely demonstrated by X-ray crystallography. For detailed information For more information click here »

UCLA scientists reported that the FDDNP PET scan can detect brain degeneration early in aging, before cognitive symptoms appear, pointing to the scan's ability to track changes in the brain over time. For more information click here »

In patients with major depression, FDDNP PET levels were higher throughout the brain and in critical brain regions that control decision-making, memory and emotions. For more information

Using FDDNP PET scans, scientists observed Alzheimer's brain pathology before patients developed symptoms. For more information click here »

An automated method for analyzing FDDNP PET scans outperformed a manual method in differentiating Alzheimer's disease patients from those with mild cognitive impairment and normal aging. For more information click here »

Researchers found that FDDNP levels were higher in older non-demented adults who had greater more self-reported memory symptoms. For more information click here »

In the first study of its kind, FDDNP PET scans of Down syndrome showed abnormal brain protein patterns consistent with previous autopsy studies. For more information click here »

Investigators compared the FDDNP PET scan to another PET scan that only measures amyloid protein deposits. For more information click here »

The FDDNP PET scan demonstrated abnormal brain proteins in a small animal with an Alzheimer's human gene. For more information click here » and here »

Scientists from Korea found the expected differences in brain signal patterns when they compared the FDDNP PET scan to a PET scan that only measures amyloid protein and another that measures brain function. For more information click here » see also here »Older volunteers at genetic risk for dementia showed high FDDNP levels in a brain region known to control memory and accumulate tau protein. For more information click here »

In 2002, UCLA scientists reported the first FDDNP PET scan studies in humans and showed high FDDNP brain levels in patients with Alzheimer's disease compared with normal older controls. For more information click here »







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FAOs

I keep hearing this term Chronic Traumatic Encephalopathy or CTE. What does it

Chronic Traumatic Encephalopathy or CTE is a progressive degenerative disease of the brain caused by repetitive brain trauma, including symptomatic concussions (i.e., when people lose consciousness) as well as asymptomatic sub-concussive hits to the head. CTE affects contactsports athletes (e.g., boxers, football and soccer players), military personnel, auto accident victims, or anyone who has sustained head injury. The head trauma triggers a progressive degeneration of the brain tissue that leads to accumulation of an abnormal protein called tau, which can begin decades after the last brain trauma or end of an active athletic career. The brain degeneration is associated with memory loss, confusion, impaired judgment, impulse control problems, aggression, depression, and, eventually, progressive dementia.

How does a PET scan of tau differ from an amyloid PET scans?

The FDDNP PET scan (licensed to TauMark) is the only currently available method to measure brain tau proteins in living people. Autopsies of CTE victims show an overwhelming presence of tau proteins in specific brain regions, which differ from the tau accumulation patterns observed in other diseases like Alzheimer's. The amyloid PET scans do not measure tau at all.

If FDDNP measures both amyloid and tau, how do I know which is lighting up in my

The pattern of FDDNP accumulation allows doctors to recognize whether the brain signal most likely represents CTE. Alzheimer's disease, both, or some other condition. In Alzheimer's, tau has a high concentration in the hippocampus memory center (underneath the temples). In CTE, doctors see high tau counts in deep brain centers (like the brain stem and thalamus), the amygdala (which controls emotional reactions) and cortical areas. The ability of FDDNP PET scans to also detect brain abnormalities of other diseases (e.g., amyloid in Alzheimer's disease) is an added advantage of scans, which can help in identifying the pattern of Alzheimer's disease when present in advanced CTE.

My son is starting football and my daughter is playing soccer this year, and I am concerned about symptoms of concussions. What are they?

Symptoms of a concussion fit into four main categories:

- . Thinking and memory (e.g., trouble concentrating, forgetfulness, slow thinking);
- Physical (e.g., headache, nausea, vomiting, dizziness, light/noise sensitivity, fatigue, balance problems);
- Emotional (e.g., sadness, irritability, anger, anxiety);
- Sleep (e.g., insomnia, too much sleep).

I've heard a lot in the news about Traumatic Brain Injury. What exactly is TBI?

Traumatic brain injury or TBI occurs when an external force, such as a violent blow or jolt to the head or body, injures the brain. Mild TBI may cause temporary dysfunction of brain cells, but more serious injury can result in permanent long-term physical damage to the brain and a variety of physical and mental symptoms. Some symptoms may be immediate (e.g., loss of consciousness, headache, dizziness), while others may appear days, weeks, or years later (e.g., depression, Alzheimer's dementia).

What are the signs and symptoms of TBI and when should someone see the doctor? Traumatic brain injury can cause a range of signs and symptoms from mild (e.g., brief loss of consciousness, confusion, memory loss, headache, dizziness, nausea, vomiting, anxiety,

fatigue, insomnia) to more moderate and severe ones (e.g., agitation, combativeness, slurred speech, inability to awaken, persistent headache, seizures, and dilated pupils)

Always see your doctor if you have received a blow to the head or body that concerns you or causes any of the above symptoms and seek emergency care if there are signs or symptoms of TBI after a recent blow to the head. Your symptoms may be "mild," but could still result from a serious brain injury that requires prompt attention and an accurate diagnosis.





NFL's Concussion Crisis

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News

Traumatic Brain Injury Conference April 16-17, 2014 see more »

Time Magazine highlights CTE and football

see more »

San Diego Union covers trauma from sports see more »

Dr. Bennet Omalu discusses CTE and brain injuries see more $\ensuremath{\mathsf{w}}$

Dr. Julian Bailes discusses consequences of head trauma see more $\ensuremath{\text{*}}$

Conversation with PBS Newshour about UCLA study of NFL players see more »

New York Times covers first PET scan study of retired NFL players

Headstrong discussion on CTE see more »

ABC's Nightline program on long-term impact of concussions see more »

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